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**Shirley E. Law\*** (selaw@ncsu.edu). *The Hopf Algebra of Sashes.*

A general lattice theoretic construction of Reading constructs sub Hopf algebras of the Malvenuto-Reutenauer Hopf algebra (MR) of permutations. The products and coproducts in these sub Hopf algebras are defined extrinsically in terms of the embedding in MR. The goal of this research is to find an intrinsic combinatorial description of a particular one of these sub Hopf algebras. The Hopf algebra in question has a natural basis given by permutations that I call Pell permutations because they are counted by the Pell numbers, which are defined by a recurrence similar to the Fibonacci recurrence. Additionally, the Pell numbers count a combinatorial object that I call a sash, which is a tiling of a 1 by  $n$  rectangle with three types of tiles: black 1 by 1 squares, white 1 by 1 squares, and white 1 by 2 rectangles.

I will describe a bijection between Pell permutations and sashes, an intrinsic description of the product in terms of sashes, and the natural partial order on sashes. I am currently working on an intrinsic description of the coproduct. (Received June 27, 2011)